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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,023	09/15/2003	Tinku Acharya	42P15466X	3501

8791 7590 03/19/2007  
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EXAMINER
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MADDEN, GREGORY VINCENT

ART UNIT	PAPER NUMBER
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2622

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/664,023

Applicant(s)

ACHARYA, TINKU

Examiner

Gregory V. Madden

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-104 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 25, 46-49, 70, 71, 76 and 81-84 is/are rejected.
- 7) ☒ Claim(s) 5-24, 26-45, 50-69, 72-75, 77-80 and 85-104 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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**DETAILED ACTION*****Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

**Claims 1-4, 25, 46-49, and 70-71** are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claim 1-3, 5, 14, 26-29, 39, and 41 of copending Application No. 10/376,156.

This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Further, **claims 76 and 81-84** are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claim 1 and 29-32 of copending Application No. 10/376,127. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

***Claim Objections***

**Claims 20, 41, 65, 75, 80, and 100** are objected to because of the following informalities: The Applicant's specification, while being enabling for a sensor unit having the following predetermined pattern:

B	G	B	G
IR	R	IR	R
B	G	B	G
IR	R	IR	R

, does not reasonably provide enablement for the claimed predetermined pattern shown below:

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B	G	B	<b>B</b>
IR	R	IR	R
B	G	B	G
IR	R	IR	R

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. Note that Fig. 8 of the disclosure does not set forth the pattern claimed in claims 20, 41, 65, 75, 80, and 100, and that the formulas presented in the specification do not allow for a pattern having a repeating BGBB configuration. The formulas only allow for an alternating BGBG pattern, as shown in Fig. 8. Therefore, for the purposes of examination, claims 20, 41, 65, 75, 80, and 100 will be interpreted to have the pixel pattern as shown by Fig. 8, not that which is illustrated in the respective claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-4, 25, 46, 47, 70, 71, 76, 81, and 82 are rejected under 35 U.S.C. 102(e) as being anticipated by Acharya et al. (U.S. Pat. 6,759,646).**

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that

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any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

First, considering **claim 1**, the Acharya reference teaches an apparatus comprising a sensor unit (pixel sensor array 106) to capture wavelength intensity data for a plurality of pixel locations wherein the sensor generates a value corresponding to an intensity of light from a selected range of wavelengths (separate colors RGB) for the pixel locations and further wherein infrared intensity values (IR) are generated for a subset of pixel locations (as illustrated in Fig. 2). Acharya further shows an interpolation unit (processor 702) coupled with the sensor unit (via bus 710) to interpolate intensity data to estimate intensity values not generated by the sensor. Please refer to Figs. 2 and 7, Col. 2, Lines 51-54, Col. 4, Lines 4-9, and Col. 5, Lines 4-18.

In regard to **claim 2**, the limitations of claim 1 are taught above, and the Acharya reference again shows in Fig. 2 and Col. 2, Lines 47-60 that the red, green, blue, and infrared intensity information are captured substantially contemporaneously, as is inherently the case with most image sensors having color filter arrays.

In regard to **claim 3**, the limitations of claim 1 are shown above, and Acharya further shows a red, green, blue, and infrared pixel buffer (memory 704) coupled with the interpolation unit (processor 702) to store respective intensity data, as taught in Fig. 7 and Col. 5, Lines 4-18.

As for **claim 4**, the limitations of claim 3 are shown above, and Acharya shows that the apparatus further comprises a signal processing unit (processor 702) coupled to the red, green, blue, and infrared pixel data buffer (memory 704) in Fig. 7.

As for **claim 25**, the Acharya reference teaches an apparatus comprising a CMOS sensor (see Col. 1, Lines 21-24) to capture an array of pixel data, and a color filter array (CFA) to pass selected wavelength ranges to respective pixel locations of the CMOS sensor according to a predetermined

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pattern, wherein the wavelength ranges include at least infrared wavelengths for one or more pixel locations (see Col. 2, Lines 46-54 and Figs. 1-2):

Considering **claim 46**, the Acharya reference shows a method of receiving pixel data representing color intensity values (RGB and IR) for a plurality of pixel locations according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light having infrared wavelengths (see Fig. 2), generating intensity values for multiple color intensities corresponding to a single pixel location by interpolating intensity values corresponding to neighboring pixel locations, and promoting one or more of the generated intensity values to a user-accessible state. Please refer to Figs. 2 and 7, Col. 2, Lines 51-54, Col. 4, Lines 4-9, and Col. 5, Lines 4-18.

As for **claim 47**, the limitations of claim 46 are shown above, and Acharya further teaches the promoting of one or more of the generated intensity values to a user-accessible state comprises storing the received intensity values and the generated intensity values on a computer-readable storage device (memory 704). See Fig. 7 and Col. 5, Lines 9-12.

Next, considering **claim 70**, Acharya teaches a sensor that receives pixel data representing color intensity values for a plurality of pixel locations of a scene to be captured according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light having infrared wavelengths. Please refer to Figs. 2 and 7, Col. 2, Lines 51-54, Col. 4, Lines 4-9, and Col. 5, Lines 4-18.

Regarding **claim 71**, the limitations of claim 70 are set forth above, and the Acharya reference again shows in Fig. 2 and Col. 2, Lines 47-60 that the red, green, blue, and infrared intensity information are captured substantially contemporaneously, as is inherently the case with most image sensors having color filter arrays.

Next, considering **claim 76**, the Acharya reference teaches an apparatus comprising a lens system (optical system 102) to focus a scene to be captured (see Fig. 1 and Col. 1, Lines 12-14), and a sensor unit (pixel sensor array 106) to capture color data representing the scene passed by the lens system, the sensor

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to capture color intensity information according to a predetermined pixel pattern, wherein the color intensity information comprises at least infrared intensity information. Please refer to Figs. 2 and 7, Col. 2, Lines 51-54, Col. 4, Lines 4-9, and Col. 5, Lines 4-18.

Considering **claim 81**, Acharya teaches an article of manufacture comprising an electronically accessible medium (memory 704) having stored thereon instructions that, when executed, cause one or more processors to capture pixel data corresponding to an image to be captured for a plurality of pixel locations according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light having infrared wavelengths (see Fig. 2), generating intensity values for multiple color intensities corresponding to a single pixel location by interpolating intensity values corresponding to neighboring pixel locations, and promoting one or more of the generated intensity values to a user-accessible state. Please refer to Figs. 2 and 7, Col. 2, Lines 51-54, Col. 4, Lines 4-9, and Col. 5, Lines 4-18.

Finally, in regard to **claim 82**, the limitations of claim 81 are shown above, and Acharya shows that the instructions that cause one or more processors to promote the color intensity values to a user-accessible state comprise instructions that, when executed, cause the one or more processors to store the captured intensity values and the interpolated intensity values on a computer-readable storage device. See Fig. 7 and Col. 5, Lines 9-12.

**Claims 46, 48, 81, and 83 are rejected under 35 U.S.C. 102(e) as being anticipated by Zigaldo et al. (U.S. Pat. 6,292,212).**

While **claims 46 and 81** have been rejected previously in view of the Acharya reference (see above), the Zigaldo reference also discloses a method and article of manufacture for receiving pixel data (via sensor array 12) representing color intensity values for a plurality of pixel locations according to a predetermined pattern, wherein one or more of the color intensity values corresponds to intensity of light

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having infrared wavelengths (See Figs. 5 and 6), generating intensity values for multiple color intensities corresponding to a single pixel location by interpolating intensity values corresponding to neighboring pixel locations (via signal processing electronics 28), and promoting one or more of the generated intensity values to a user-accessible state. Please refer to Figs. 4-6, Col. 3, Lines 40-44, and Col. 4, Lines 7-63.

As for **claims 48 and 83**, the limitations of claims 46 and 81 are taught immediately above by Zigaldo, and the Zigaldo reference further discloses that the promoting of intensity values to a user-accessible state comprises generating an output image with the received intensity values and the generated intensity values and displaying the output image on a display device (CRT 32). Please refer to Col. 4, Lines 46-52 and Fig. 3.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 49 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zigaldo et al. (U.S. Pat. 6,292,212).**

In regard to **claims 49 and 84**, the limitations of claims 46 and 81 are shown above to be taught by Zigaldo, but while the Zigaldo reference does show that the promoting of intensity values to a user-accessible state involves displaying the output image on a display device, the reference does not disclose that the promoting of intensity values to a user-accessible state involves printing the output image. However, Official Notice is hereby taken that it would have been well known by those of ordinary skill in



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the art at the time the invention was made to have included a means for printing the output image. One would have been motivated to do so because by printing the output image, a hard copy of the image that is portable and can be copied in the future can be obtained by the user, whereas the display on the display screen is only useful to the user when they are near the display apparatus.

*Allowable Subject Matter*

Claims 5-24, 26-45, 50-69, 72-75, 77-80, and 85-104 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regard to claims 5, 10, 15, 20, 26, 31, 36, 41, 50, 55, 60, 65, 72-75, 77-80, 85, 90, 95, and 100, the prior art fails to teach or suggest the specific claimed predetermined pixel patterns containing red, green, blue, and infrared intensity information.

As for claims 6-9, 11-14, 16-19, 21-24, 27-30, 32-35, 37-40, 42-45, 51-54, 56-69, 61-64, 66-69, 86-89, 91-94, 96-99, and 101-104, these claims are dependent on claims 5, 10, 15, 20, 26, 31, 36, 41, 50, 55, 60, 65, 72-75, 77-80, 85, 90, 95, and 100, which are objected to above as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Inoue et al. (U.S. Pat. 5,926,238)

Kohler (U.S. Pat. 7,109,470)

Adler (U.S. Pat. 6,659,940): Note the pixel pattern of Fig. 12

Oozu et al. (U.S. Pat. 5,801,373): Note Figs. 14-21

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Laroche et al. (U.S. Pat. 5,373,322): Note the interpolation process set forth in Col. 3, Lines 35-43, and Col. 4, Lines 36-42

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory V. Madden whose telephone number is 571-272-8128. The examiner can normally be reached on Mon.-Fri. 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc Yen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Gregory Madden  
March 15, 2007

  
NGOC-YEN VU  
SUPERVISORY PATENT EXAMINER